



Designation: D 3042 – 97

Standard Test Method for Insoluble Residue in Carbonate Aggregates¹

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1. Scope

1.1 This test method covers determination of the percentage of insoluble residue in carbonate aggregates using hydrochloric acid solution to react the carbonates.

1.2 The values stated in inch-pound units are to be regarded as standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precaution statements are given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates²

C 294 Descriptive Nomenclature for Constituents of Natural Mineral Aggregates²

C 670 Practice for Preparing Precision and Bias Statements for Test Methods of Construction Materials²

D 4753 Specification for Evaluating, Selecting, and Specifying Balances and Scales for Use in Testing Soil, Rock, and Related Construction Materials³

E 11 Specification for Wire-Cloth and Sieves for Testing Purposes⁴

3. Significance and Use

3.1 The amount and size distribution of noncarbonate (insoluble) material in carbonate aggregates is of interest to those conducting research on the polish susceptibility of stone used in pavements or on the friction properties of pavement surfaces. In addition, some agencies utilize the test for acceptance purposes to delineate carbonate aggregates that may polish excessively and become slippery and those that will not.

4. Apparatus

4.1 *Sieves*, U.S. standard 8-in. (203.2-mm) diameter, conforming to Specification E 11 in the following sizes:

$\frac{3}{8}$ -in.	(9.5-mm)
No. 4	(4.75-mm)
No. 8	(2.36-mm)
No. 16	(1.18-mm)
No. 30	(600-μm)
No. 50	(300-μm)
No. 100	(150-μm)
No. 200	(75-μm)

4.2 *Balance*—A balance having a minimum capacity of 15 kg and meeting the requirements of Specification D 4753, Class GP5.

4.3 *Oven*, of appropriate size capable of being maintained at $230 \pm 9^\circ\text{F}$ ($110 \pm 5^\circ\text{C}$).

4.4 *Agitation Equipment*, such as a jar mill or a magnetic stirrer.

4.5 *Bunsen Burner or Hot Plate*.

4.6 *Receiving Tank*, of nonreactive material to receive wash water and residue washed through the 8-in. (203.2-mm) diameter sieves.

4.7 *Rapid Filter Paper*, acid-resistant.

4.8 *Safety Eyeglasses, Rubber Gloves, Aprons, etc.*

4.9 *Borosilicate Glass Containers*, for performing acid leaching test.

4.10 *pH Paper*.

5. Reagent

5.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.⁵ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 *Hydrochloric Acid (6 N)*—Prepare a 6 N solution of hydrochloric acid (HCl).

¹ This test method is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.51 on Aggregate Tests.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

⁵ “Reagent Chemicals, American Chemical Society Specifications,” Am. Chemical Soc., Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see “Reagent Chemicals and Standards,” by Joseph Rosin, D. Van Nostrand Co., Inc., New York, NY, and the “United States Pharmacopeia.”